1/17

Time Domain of Spectral Distribution of Hyper Dense Photonic Signal

Time Averaged Photonic Hyper Dense Spectrum

Time Domain of Spectral Distribution

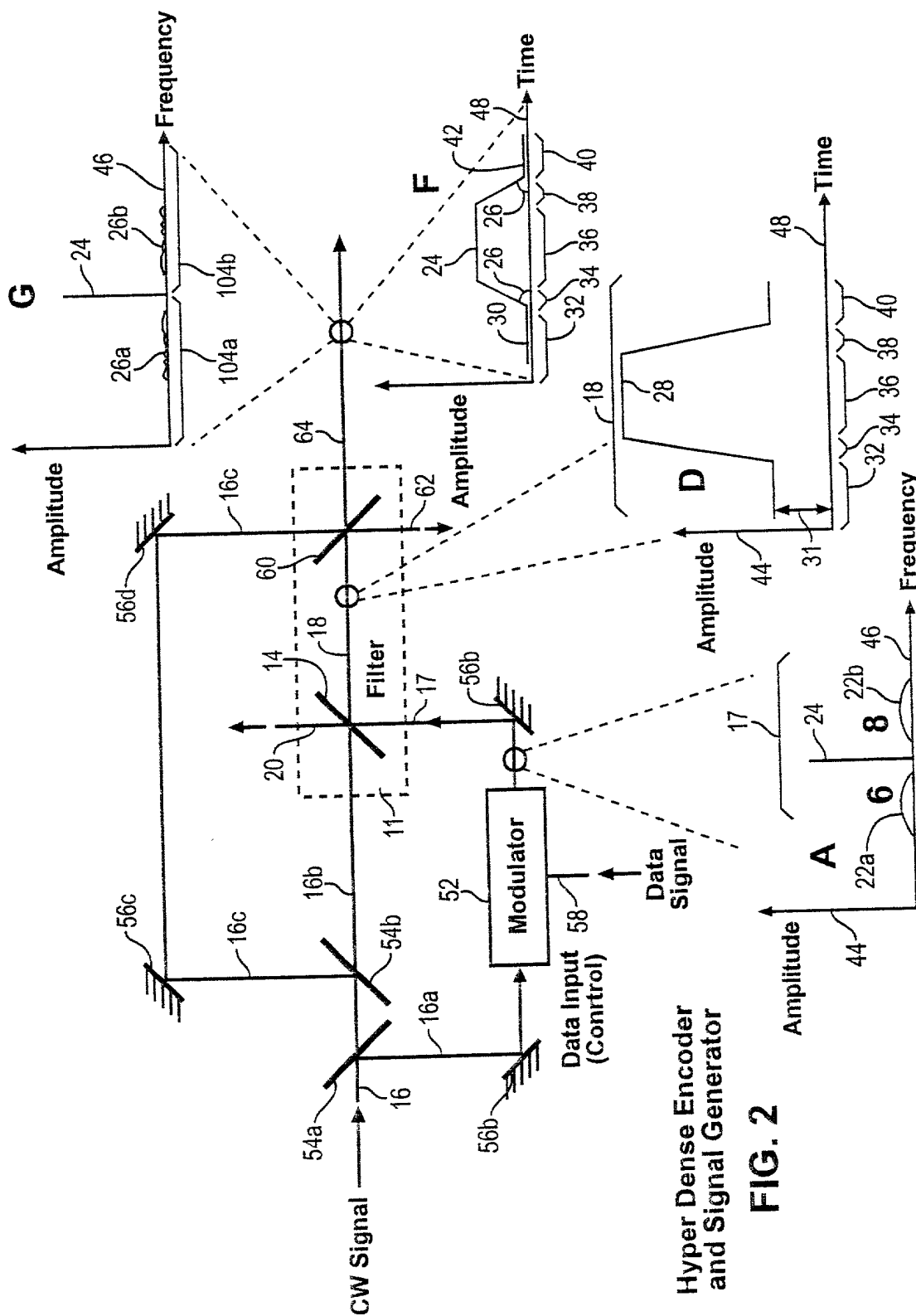**Time Averaged Input and Output Spectrum**
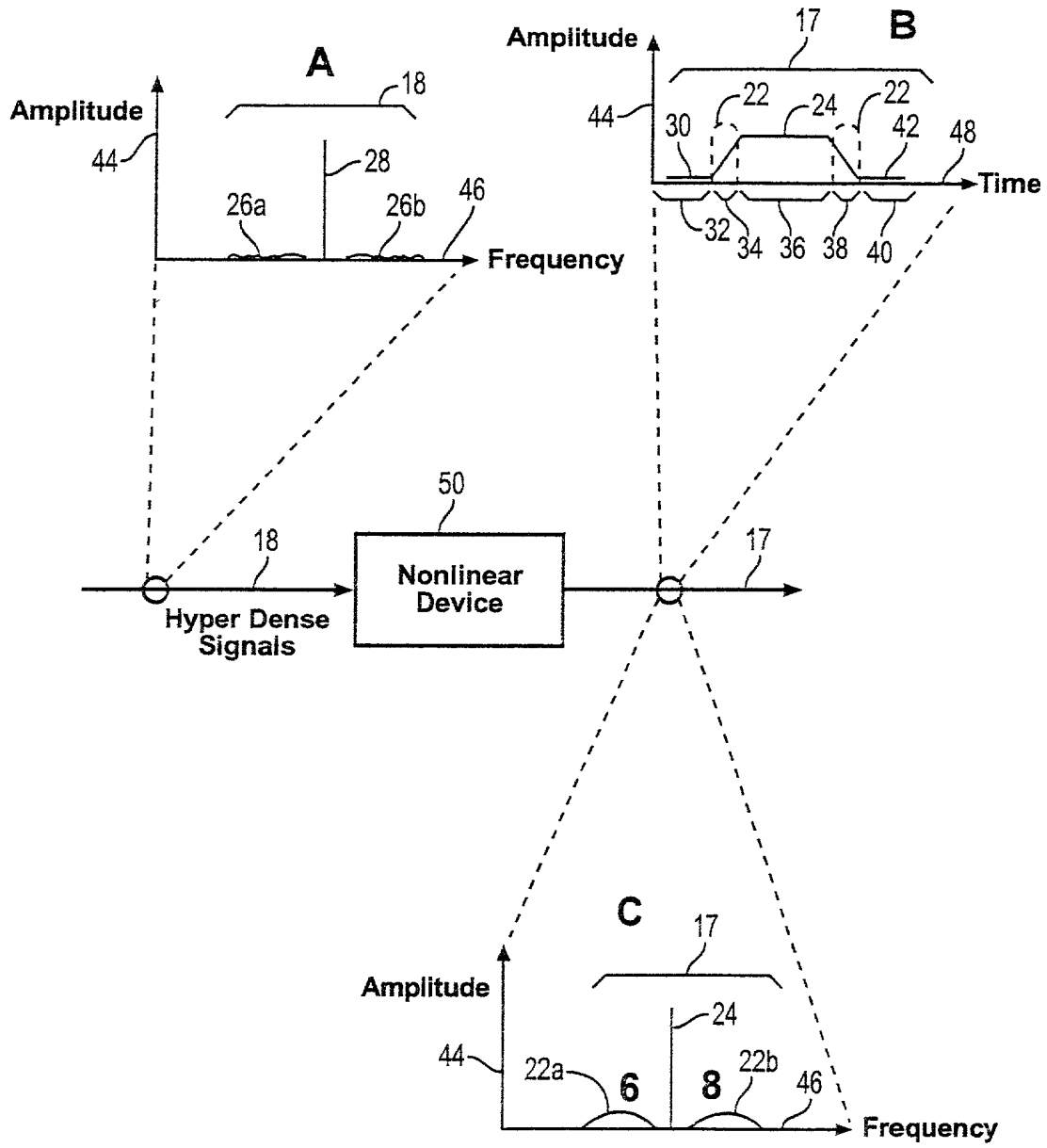
Modulated Source

FIG. 1

Hyper Dense Encoder
and Signal Generator

FIG. 2

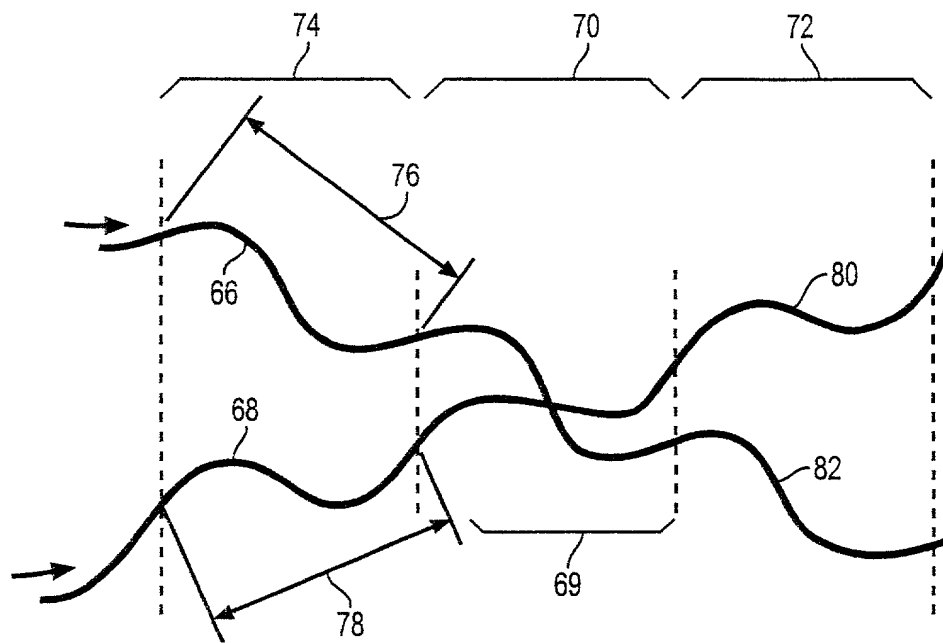**FIG. 3**
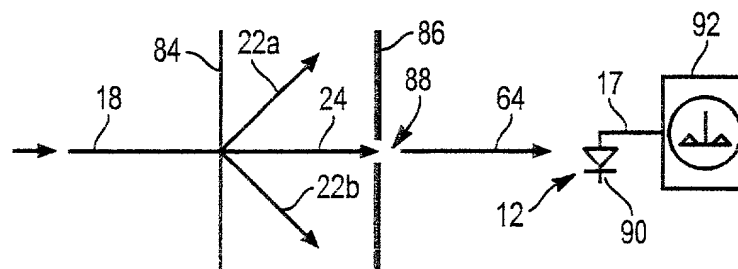
FIG. 4

FIG. 5

FIG. 6

Sender

Signal Source for Modulated Photonic Signal 12

Modulated Input Signal 17

Frequency-Selective Filter 10 11

Output 64

94

96

Telecommunications Network

98

100

50 Nonlinear Photonic Device

Receiver

Reconstituted Modulated Signal 17

Information Post Processing 102

f_2 26a 24 44 26b 46 f_1 f_0 A

f_2 22b 24 44 46 f_1 f_0 A 22a

f_2 22b 24 44 46 f_1 f_0 A 22a

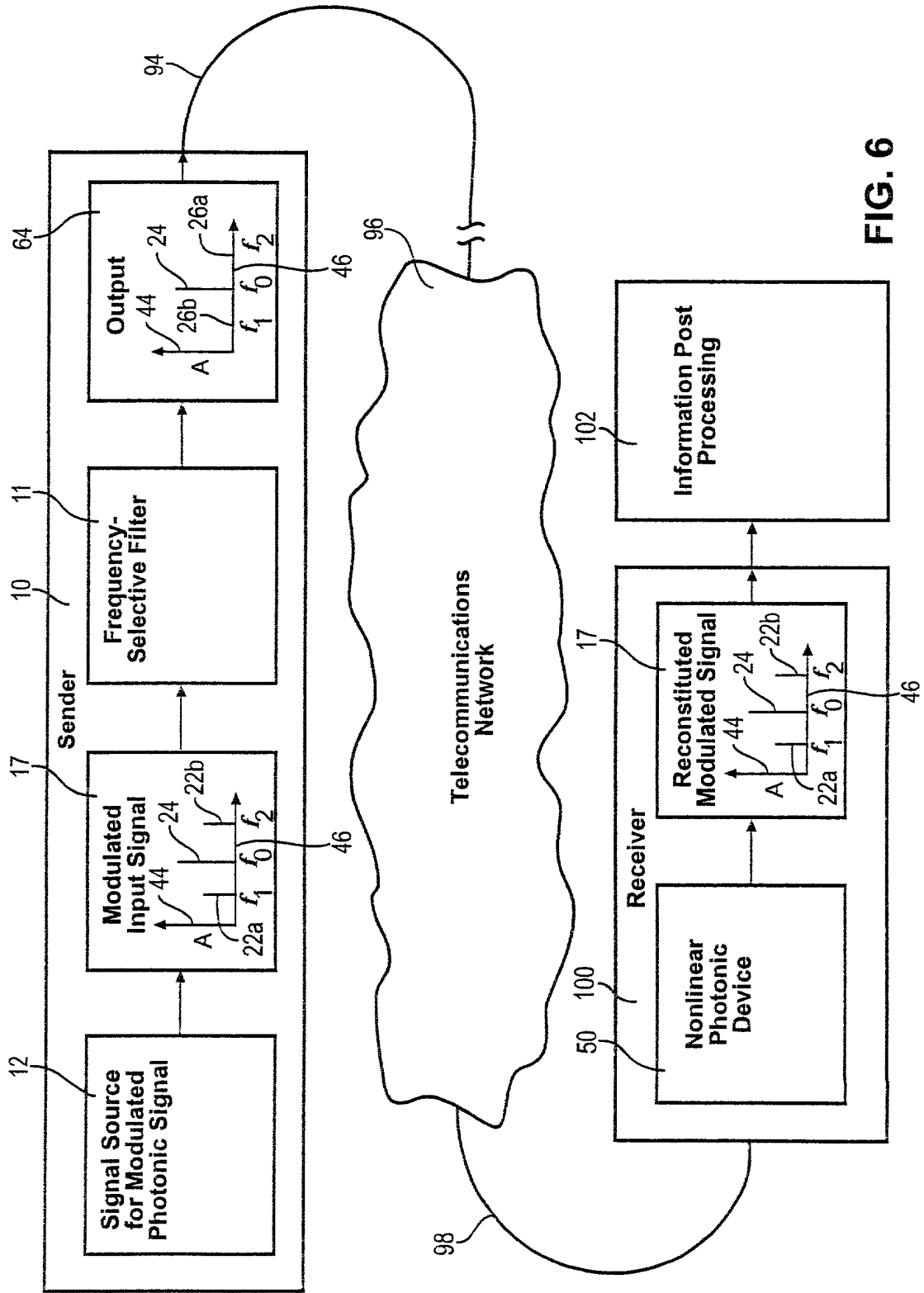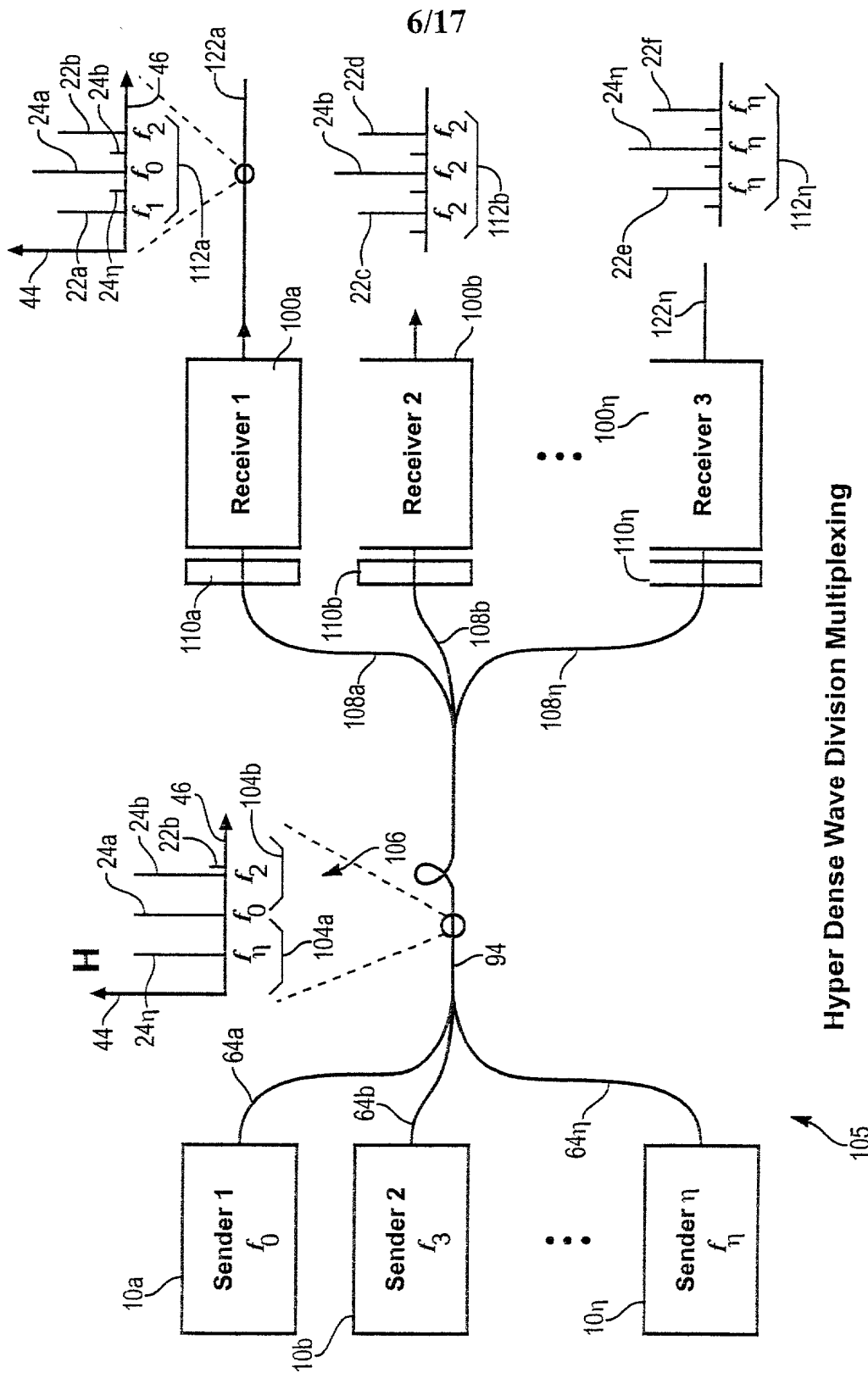**FIG. 7**

Hyper Dense Wave Division Multiplexing

FIG. 8
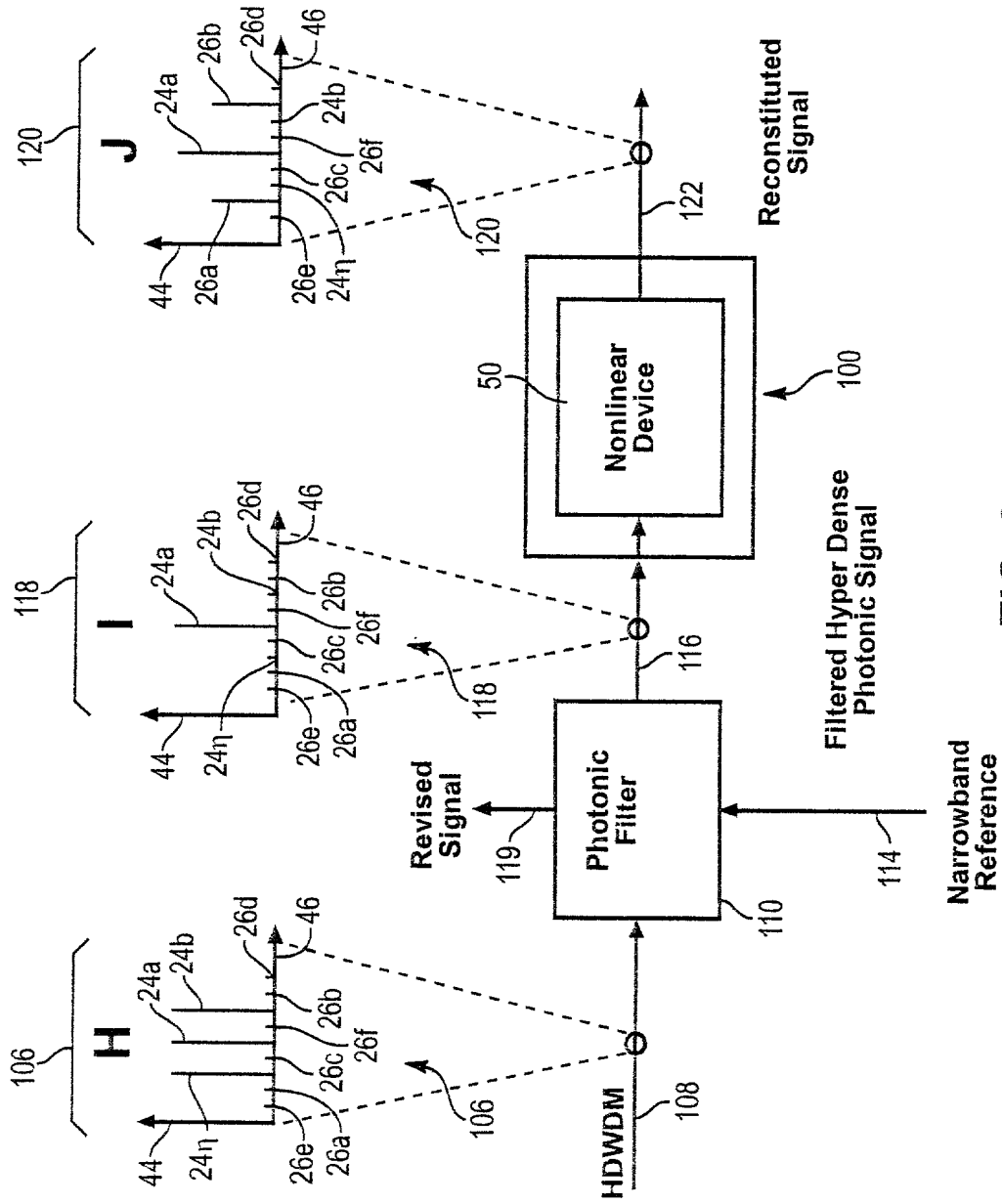
Hyper Dense Wave Division Demultiplexor (HDWDDM)
Using Drop-Filter Band Selection

Input
Signal
A

124

126

114

Narrowband
Reference
Input
Channel 1

110a

Channel
1

119a

122

Data Output
Channel 1

132a

110b

Channel
2

I/O

132b

119b

110η

Channel
3

I/O

132η

119c

119η

Broadband Output Data
Notched by Intervening
Channel Bands 1, 2, & 3

To Next
Stages

FIG. 9

Drop Filter

126

Narrowband Input
Reference Signal

128

138 — Frequency Phase Compensator

Broadband
Input
Signal

124

136a

L₁

140

L₂

136b

BS₁

142

Path 1

Path 2

144

146a

M₁

M₂

146b

Combiner

134

148

130

Residual
Output

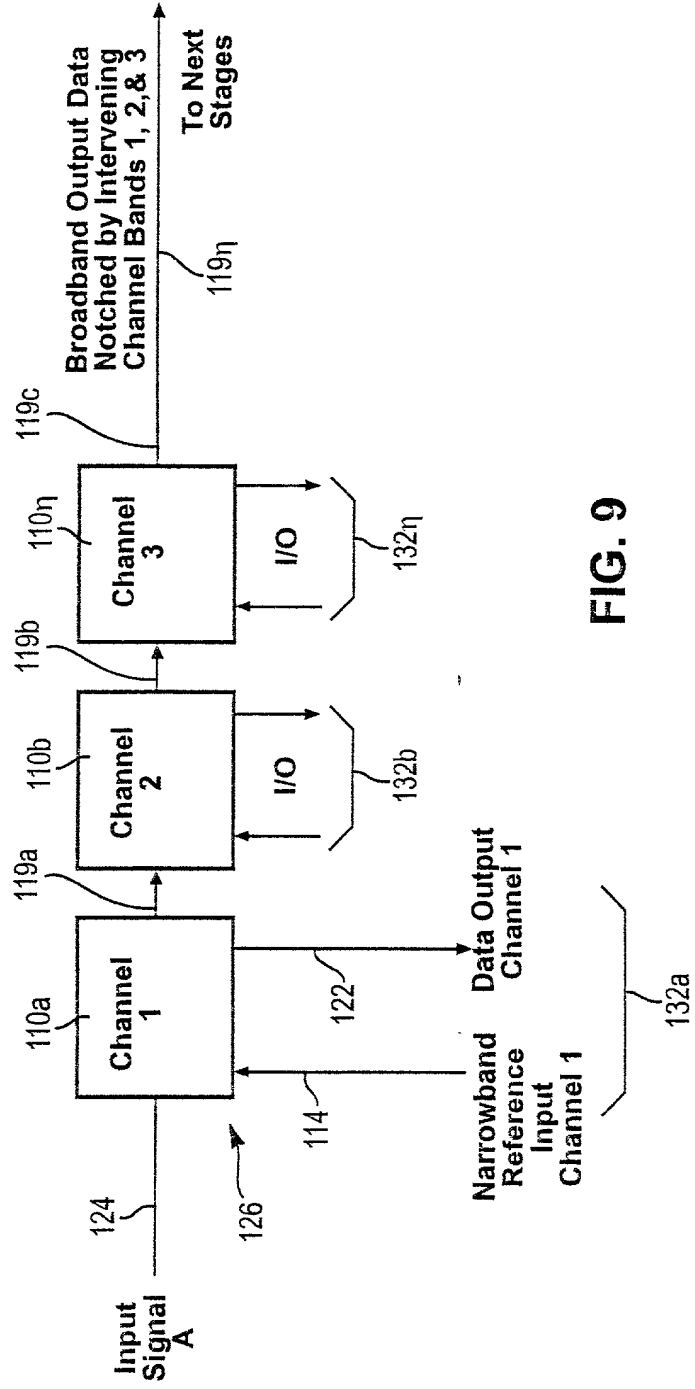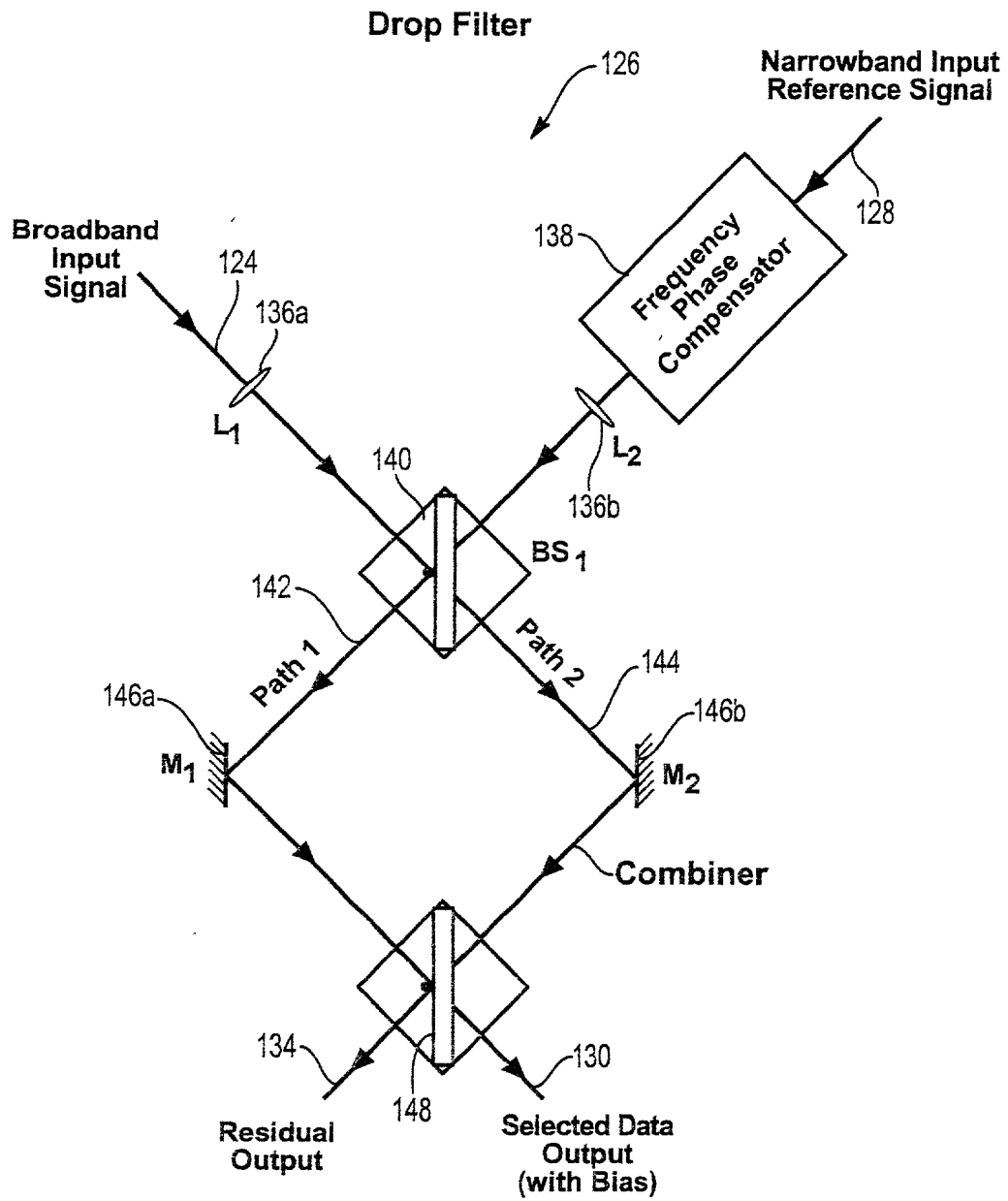Selected Data
Output
(with Bias)

FIG. 10

Super Hyper Wave Division Demultiplexor (HDWDDM)
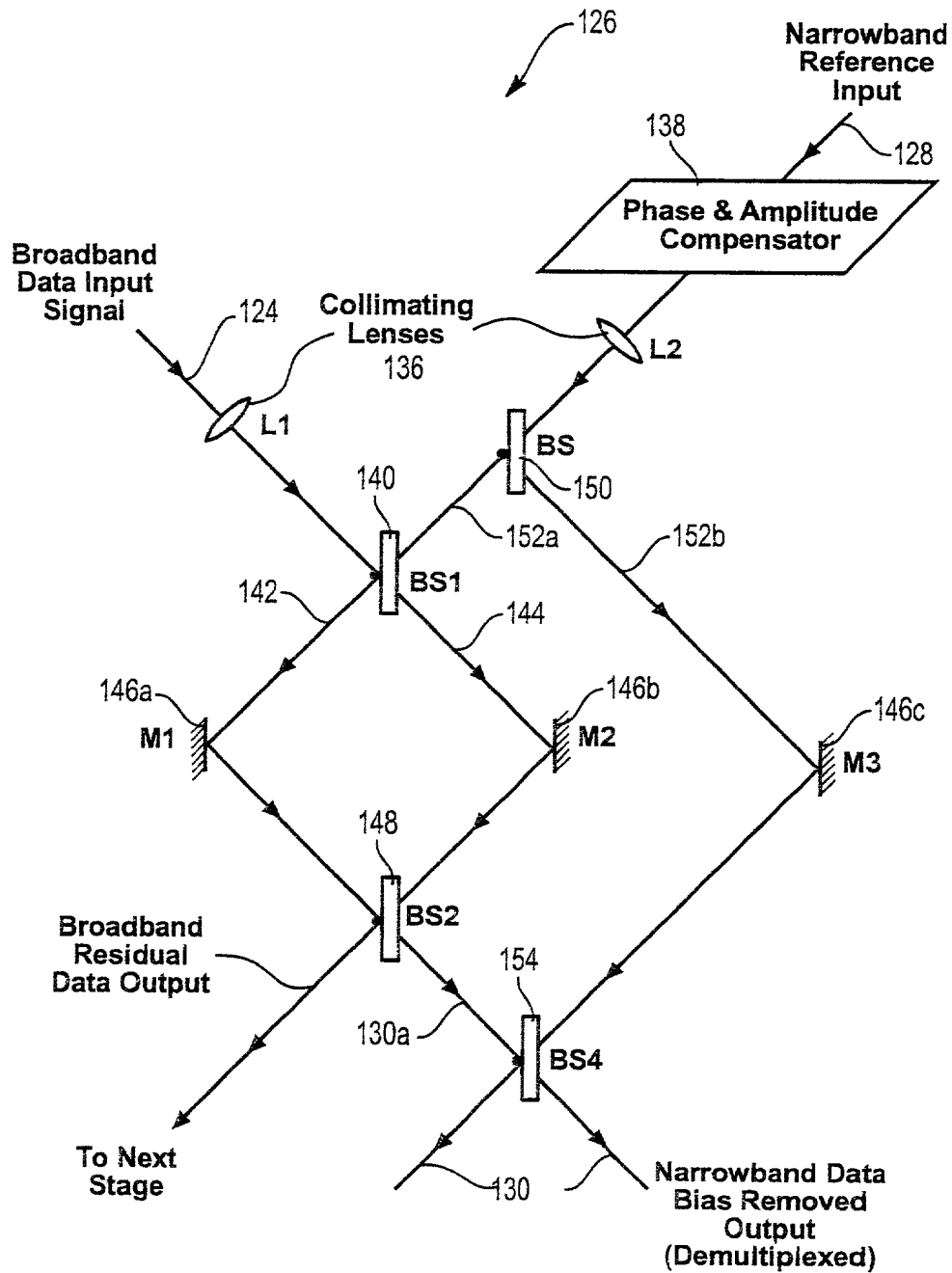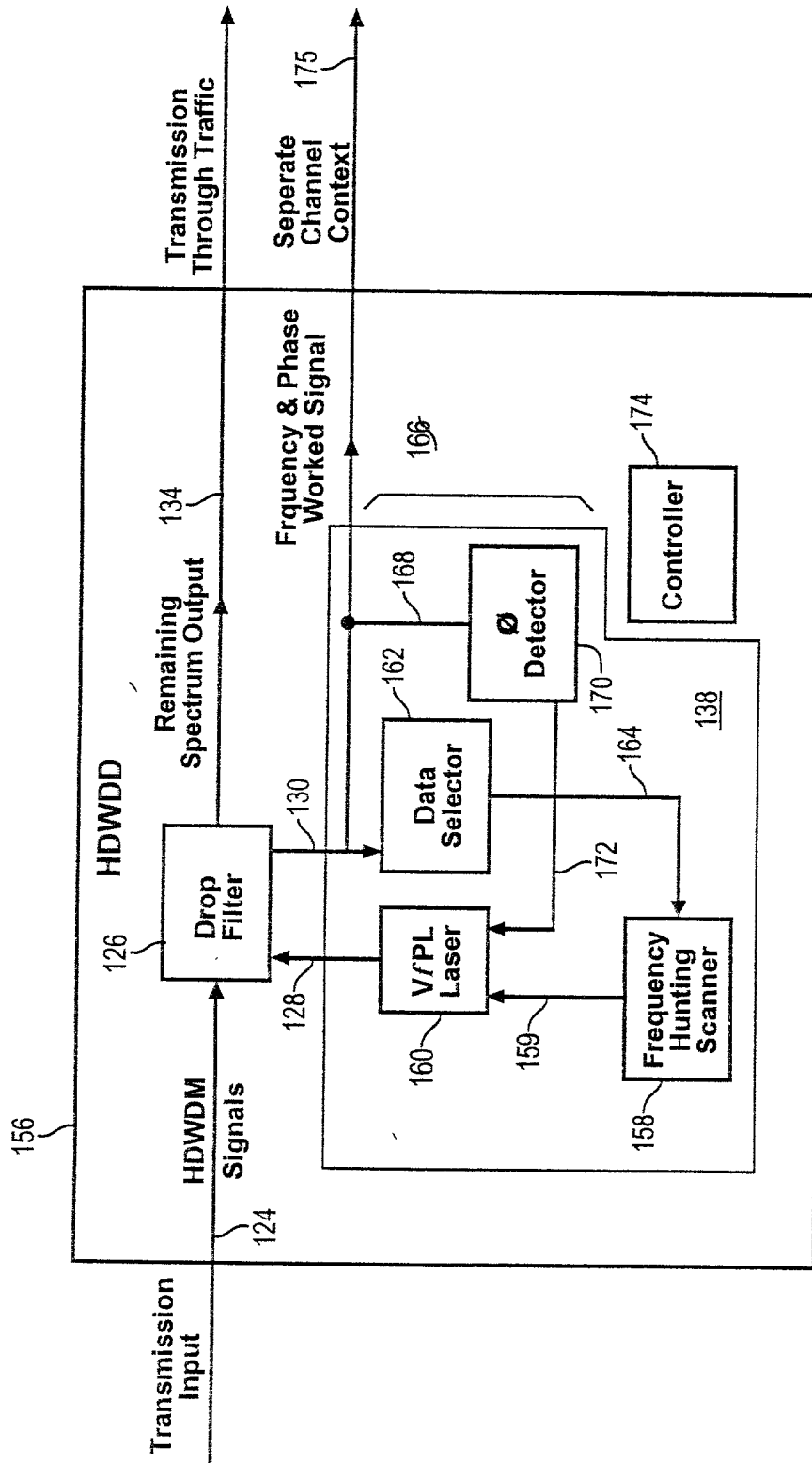## Using Drop Filter Band Selection

FIG. 11

FIG. 12

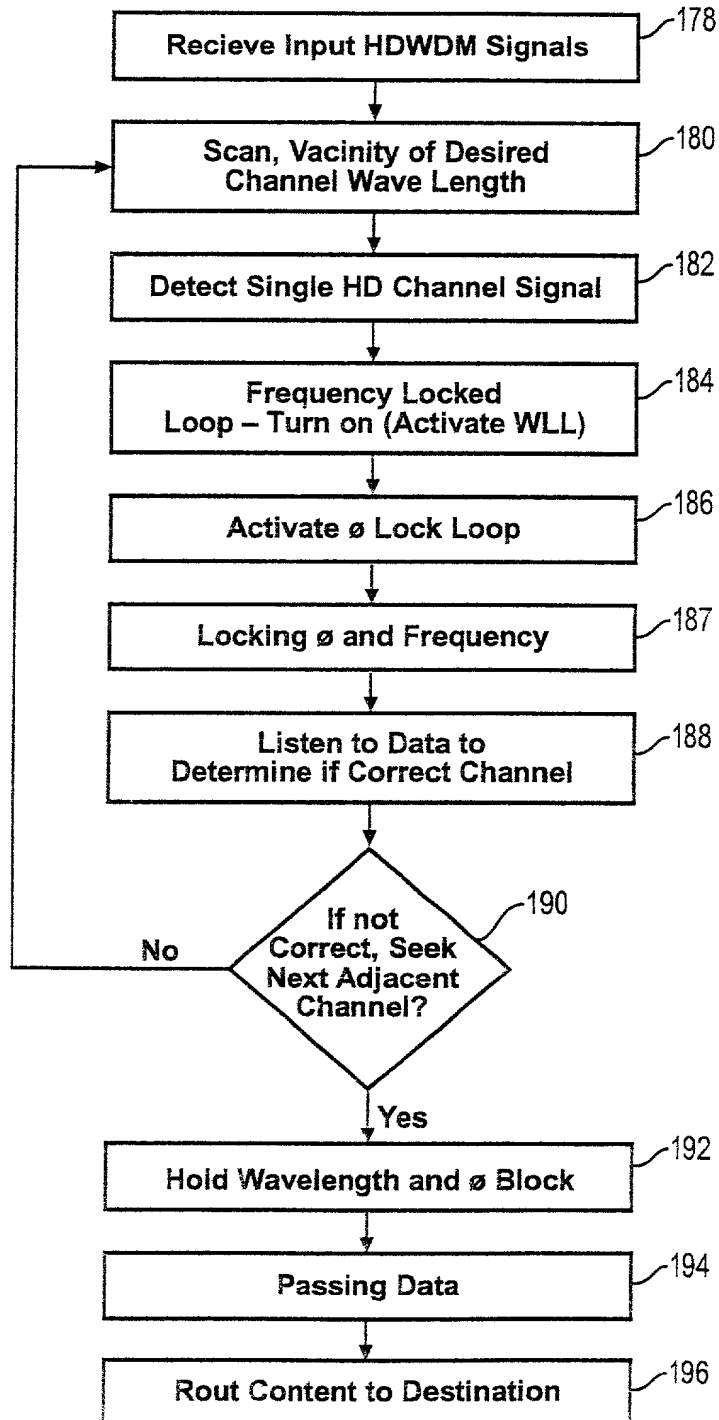Hyper Dense Channel Separator

Channel–Selection Process

176

| Recieve Input HDWDM Signals | 178 |

| Scan, Vacinity of Desired Channel Wave Length | 180 |

| Detect Single HD Channel Signal | 182 |

| Frequency Locked Loop – Turn on (Activate WLL) | 184 |

| Activate ø Lock Loop | 186 |

| Locking ø and Frequency | 187 |

| Listen to Data to Determine if Correct Channel | 188 |

If not Correct, Seek Next Adjacent Channel? — 190

No

Yes

| Hold Wavelength and ø Block | 192 |

| Passing Data | 194 |

| Rout Content to Destination | 196 |

FIG. 13

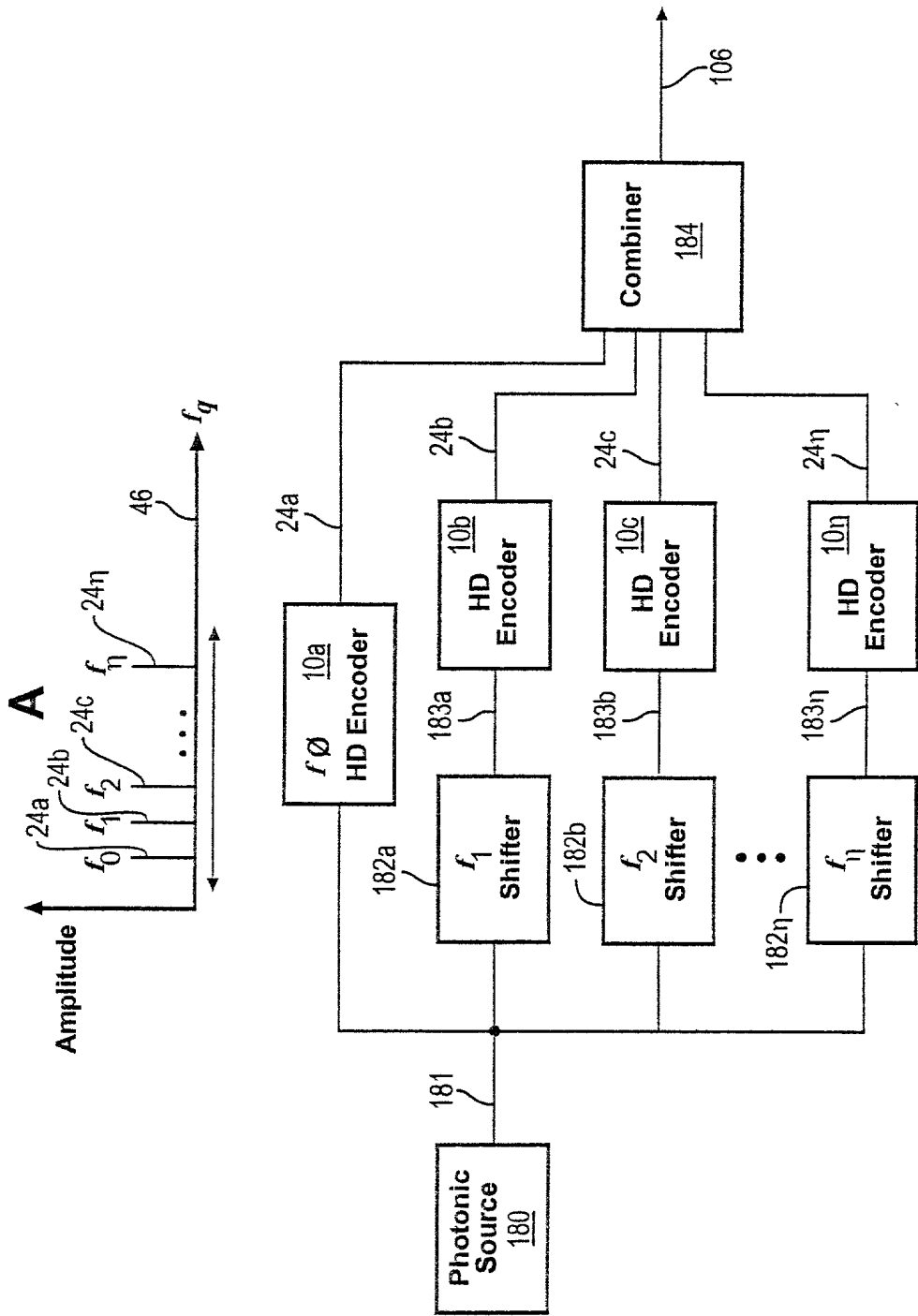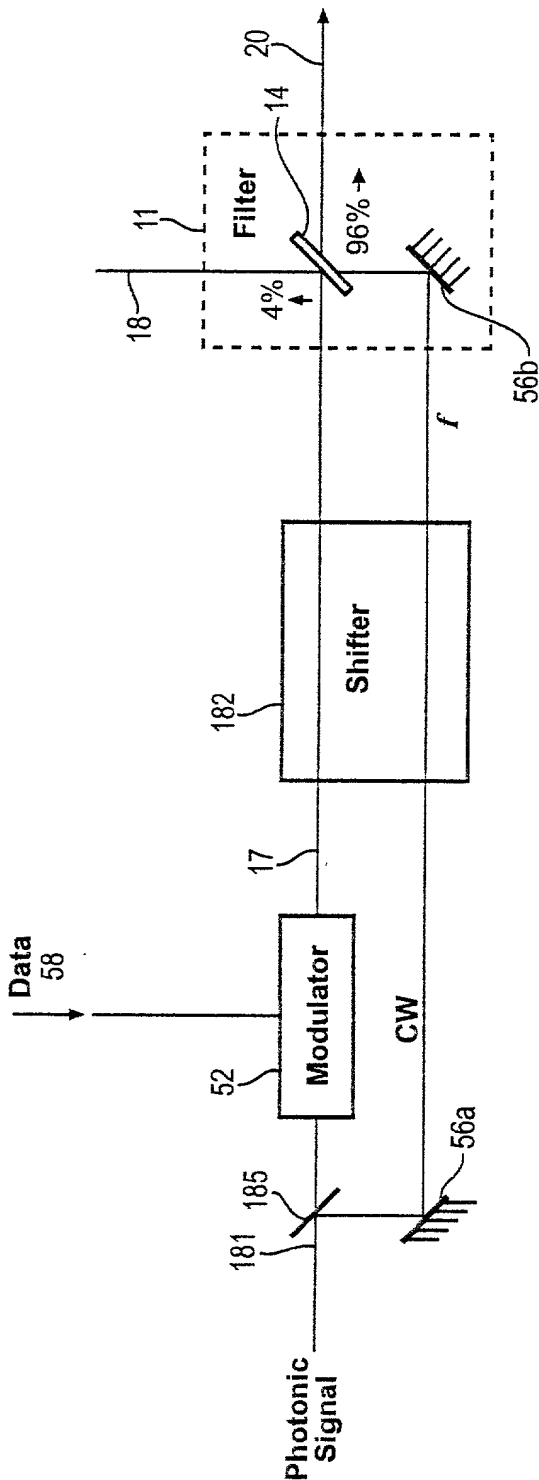FIG. 14

HDWDM Multiplexer

Hyper Dense Frequency Shifted Signals
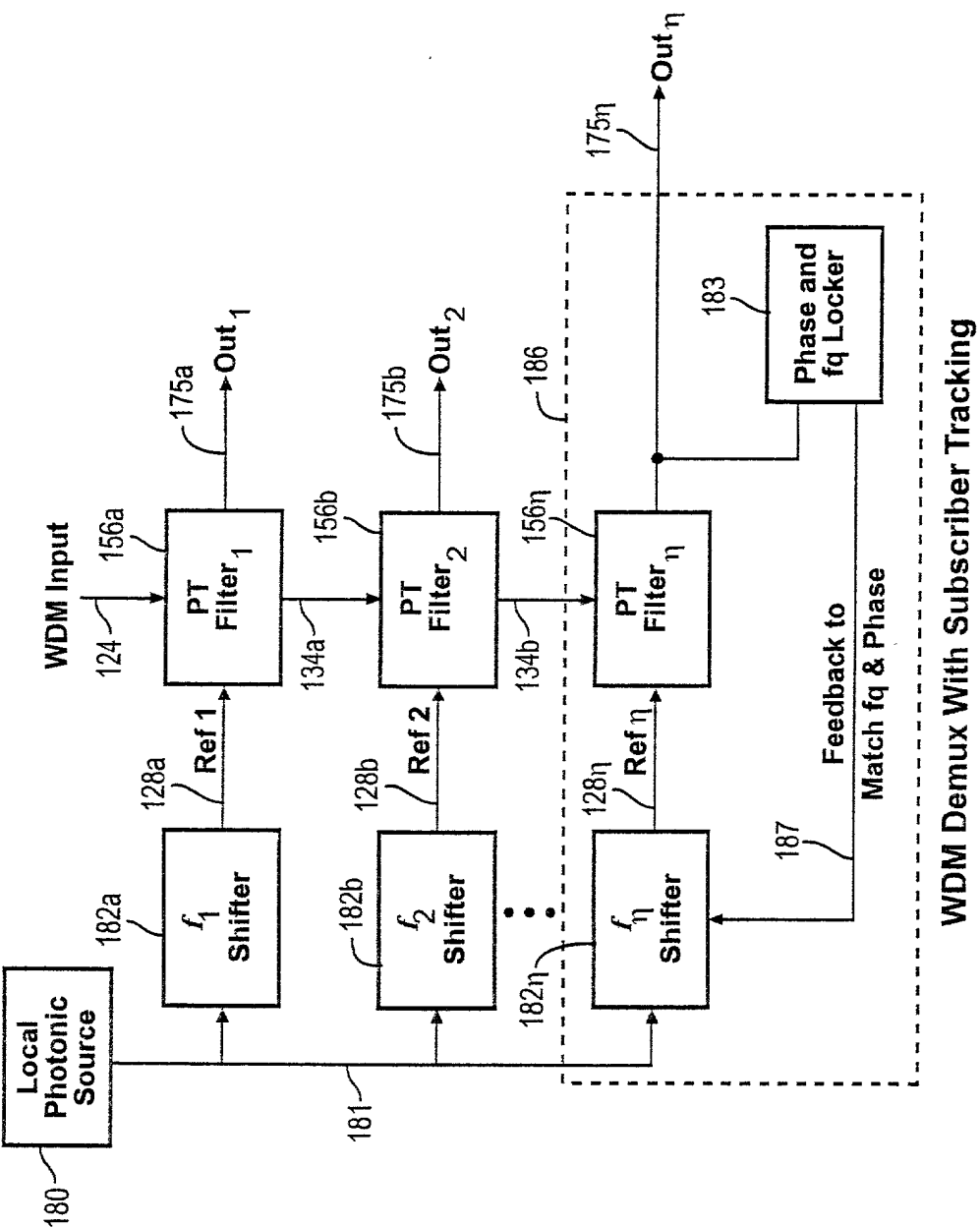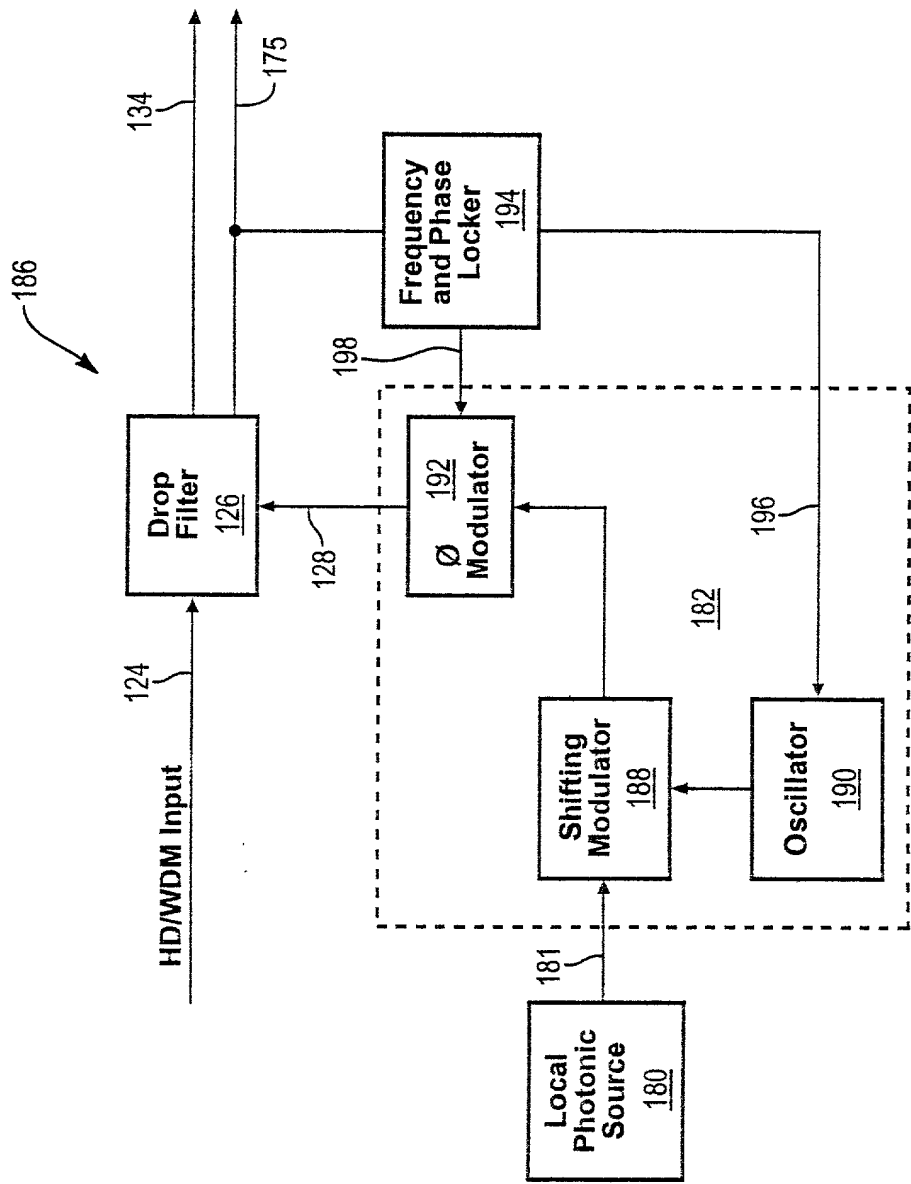
FIG. 15

FIG. 16
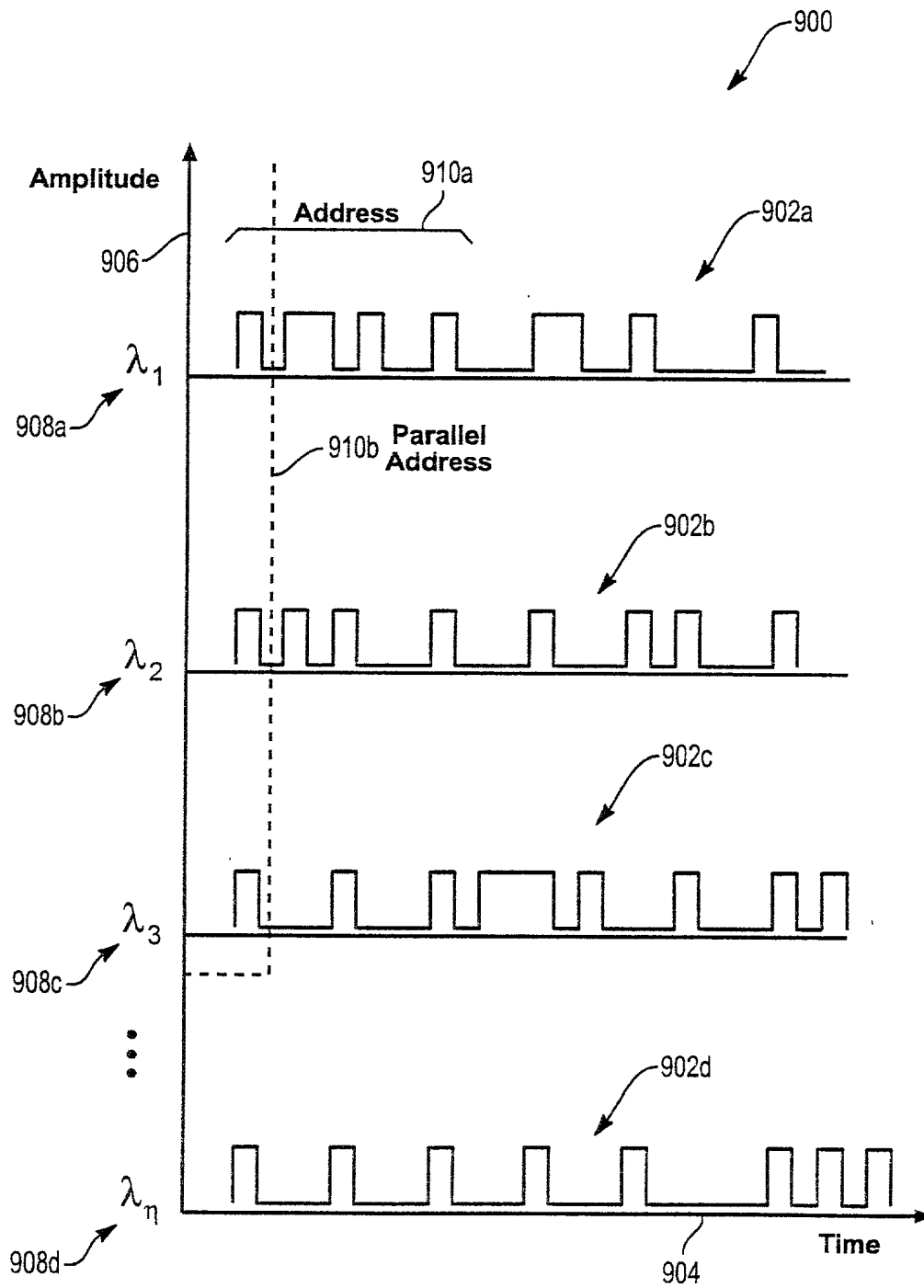
WDM Demux With Subscriber Tracking

Channel Separation Assembly

FIG. 17

Multi–Wavelengths Packet

FIG. 18